

12/5/05

FORM PTO-1449 U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE INFORMATION DISCLOSURE STATEMENT (Use several sheets if necessary)	ATTY. DOCKET NO.: 36287-00900	SERIAL NO.: 09/671,783
	APPLICANTS: JEAN-PIERRE LARDY, et al..	
	FILING DATE: September 27, 2000	GROUP ART UNIT: 3627

U.S. PATENT DOCUMENTS

EXAMINER INITIAL	DOCUMENT NUMBER	DATE	NAME	CLAS S	SUBCLA SS	FILING DATE IF APPROPRIATE
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OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Papers, Etc.)

eg ✓			Jean-Pierre Lardy; E2C: A Simple Model to Assess Default Probabilities from Equity Markets; JP Morgan Credit Derivatives Conference, January 16, 2002
✓			Finger, Christopher C., Finkelstein Vladimir, Pan George, Lardy Jean-Pierre, Ta Thomas; Credit Grades, Technical Document; May 2002
✓			Risk Currencies, interest rates, equities commodities, credit; Breaking Down the Barriers; pgs 2, 28, 29, 30, 33, 35; Vol. 4/No 8, September 1991
✓			Equity to credit pricing; www.risk.net ; pages 107-100, November 2001
h			Leland, Hayne E., Journal of Finance; Corporate Debt Value, Bond Covenants, and Optimal Capital Structure; pages 1213-1252, Vol. XLIX, No. 4, September 1994
✓			Hull, John, White, Alan; Journal of Derivatives; Valuing Credit Default Swaps II: Modeling Default Correlations; http://web33.epnet.com ; pages 12-21, Vol. 8 Issue 3, Spring 2001
✓			Longstaff, Francis A., Schwartz, Eduardo S., Journal of Finance; A Simple Approach to Valuing Risky Fixed and Floating Rate Debt; pages 789-819, Vol. L., No. 3, July 1995
✓			Black, Fischer, Scholes, Myron; Journal of Political Economic; The Pricing of Options and Corporate Liabilities; pages 637-654, May 1972
✓			RiskMetrics Group, Introducing Credit Grades; Promoting Transparency in credit pricing
✓			Black, Fischer, Cox, John C., Journal of Finance; Valuing Corporate Securities: Some Effects of Bond Indenture Provisions, pages 351-367, Vol XXXL, No. 2, May 1976
✓			Schöbucher, Philipp J, Credit Derivatives Pricing Models: Models, Pricing and Implementation
✓			Merton, Robert, C., On the Pricing of Corporate Debt: The Risk Structure of Interest Rates; pages 449-470
EXAMINER	eg		DATE CONSIDERED 12/5/05

Please type a plus sign (+) inside this box → ☐

PTO/SB/21 (08-00)

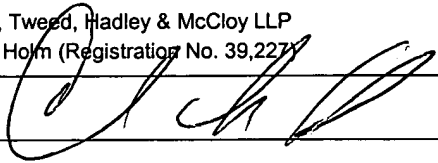
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TRANSMITTAL FORM (to be used for all correspondence after initial filing)		Application Number	09/671,783
		Filing Date	September 27, 2000
		First Named Inventor	JEAN-PIERRE LARDY, et al.
		Group Art Unit	3627
		Examiner Name	Elaine L. Gort
Total Number of Pages in This Submission	1	Attorney Docket Number	36287-00900

ENCLOSURES (check all that apply)		
<input type="checkbox"/> Fee Transmittal Form <input type="checkbox"/> Fee Attached <input type="checkbox"/> Amendment / Response <input type="checkbox"/> After Final <input type="checkbox"/> Affidavits/declaration(s) <input type="checkbox"/> Extension of Time Request <input type="checkbox"/> Express Abandonment Request <input checked="" type="checkbox"/> Information Disclosure Statement <input type="checkbox"/> Certified Copy of Priority Document(s) <input type="checkbox"/> Response to Missing Parts/ Incomplete Application <input type="checkbox"/> Response to Missing Parts under 37 CFR 1.52 or 1.53	<input type="checkbox"/> Assignment Papers (for an Application) <input type="checkbox"/> Drawing(s) <input type="checkbox"/> Licensing-related Papers <input type="checkbox"/> Petition <input type="checkbox"/> Petition to Convert to a Provisional Application <input type="checkbox"/> Power of Attorney, Revocation Change of Correspondence Address <input type="checkbox"/> Terminal Disclaimer <input type="checkbox"/> Request for Refund <input type="checkbox"/> CD, Number of CD(s) _____	<input type="checkbox"/> After Allowance Communication to Group <input type="checkbox"/> Appeal Communication to Board of Appeals and Interferences <input type="checkbox"/> Appeal Communication to Group (Appeal Notice, Brief, Reply Brief) <input type="checkbox"/> Proprietary Information <input type="checkbox"/> Status Letter <input checked="" type="checkbox"/> Other Enclosure(s) (please identify below): Information Disclosure Statement, PTO 1449 Form and copies of the cited references.
Remarks		

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT	
Firm or Individual name	Milbank, Tweed, Hadley & McCloy LLP Chris L. Holm (Registration No. 39,227)
Signature	
Date	November 30, 2005

CERTIFICATE OF MAILING			
I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Assistant Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on this date: November 30, 2005			
Typed or printed name	Veronica Alvarez		
Signature		Date	November 30, 2005

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s) : JEAN-PIERRE LARDY, et al.

Serial No. : 09/671,783 **Group Art Unit** : 3627

Filed : September 27, 2000 **Examiner** : Elaine L. Gort

For : ***METHOD AND SYSTEM FOR DETERMINING A COMPANY'S
PROBABILITY OF NO DEFAULT***

INFORMATION DISCLOSURE STATEMENT

Box No Fee
ASSISTANT COMMISSIONER FOR PATENTS
Washington, D.C. 20231

Sir:

This Information Disclosure Statement is filed in accordance with 37 C.F.R. §§1.56, 1.97 and 1.98. The items listed on Form PTO-1449, a copy of which is enclosed, may be deemed to be pertinent to the above-identified application and are made of record to assist the Patent and Trademark Office in its examination of this application. The Examiner is respectfully requested to fully consider the items and to independently ascertain their teaching.

1. [] For each of the following items listed on the enclosed copy of Form PTO-1449 that is not in the English language, an English language translation of that item or a portion thereof or a concise explanation of the relevance of that item is enclosed:
2. [] For each of the following items listed on the enclosed copy of Form PTO-1449 that is not in the English language, a concise explanation of the relevance of that item is being incorporated in the specification of the above-identified application.
3. [] Any copy of the items listed on the enclosed copy of Form PTO-1449 that is not enclosed with this Information Disclosure Statement was previously cited by or submitted to the Patent and Trademark Office in the prior [] Continuation, [] Divisional or [] Continuation-In-Part application under 37 C.F.R. §1.60, U.S. Serial No. _____, filed _____.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s) : LARDY et al.
Serial No. : 09/671,783 **Group Art Unit** : 3627
Filed : September 27, 2000 **Examiner** : Gort, Elaine
For : ***METHOD AND SYSTEM FOR DETERMINING A COMPANY'S
PROBABILITY OF NO DEFAULT***

RESPONSE TO REQUIREMENT FOR INFORMATION

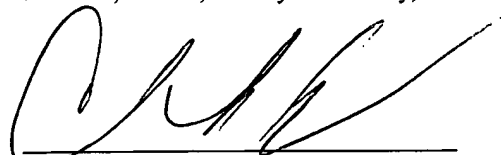
COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

On October 17, 2005, the Examiner for the above-identified patent application mailed a Requirement for Information under 37 C.F.R. § 1.105, setting a shortened two month period for response, which is set to expire on December 17, 2005.

Applicants submit herewith a declaration that is executed by Mr. Lardy, one of the named inventors, that may be helpful to the Examiner in understanding the origin of the claimed invention. Applicants also submit herewith an Information Disclosure Statement, listing documents or articles that Applicants believe are responsive to the Examiner's Requirement for Information.

Respectfully submitted,
Milbank, Tweed, Hadley & McCloy, LLP



Chris L. Holm
Reg. No.: 39,227

November 30, 2005

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NY2:#4667788

4. No fee is due under 37 C.F.R. §1.17(p) for this Information Disclosure Statement since it is being filed in compliance with:

37 C.F.R. §1.97(b)(1), within three months of the filing date of the above-identified application.

☐ 37 C.F.R. §1.97(b)(2), within three months of the date of entry into the national stage as set forth in §1.491 in an international application.

37 C.F.R. §1.97(b)(3), before the mailing date of a first Office action on the merits.

5. ☐ No fee is due under 37 C.F.R. §1.17(p) for this Information Disclosure Statement since it is being filed in compliance with 37 C.F.R. §1.97(c), after the period specified in paragraph 4 above but before the mailing date of a final action or a Notice of Allowance (where there has been no prior final action), and is accompanied by one of the certifications pursuant to 37 C.F.R. §1.97(e) set forth in paragraph 9 below.

6. ☒ A fee is due under 37 C.F.R. §1.17(p) for this Information Disclosure Statement since it is being filed in compliance with 37 C.F.R. §1.97(c), after the period specified in paragraph 4 above but before the mailing date of a final action or a notice of allowance (where there has been no prior final action):

☐ A check in the amount of \$180.00 is enclosed in payment of the fee.

☒ Charge the fee to Deposit Account No. 13-3250 Order No. 36287-00900. A DUPLICATE COPY OF THIS SHEET IS ATTACHED.

7. ☐ A fee is due under 37 C.F.R. §1.17(i)(1) for this Information Disclosure Statement since it is being filed in compliance with 37 C.F.R. §1.97(d), after the mailing date of a final action or a notice of allowance, whichever comes first, but before payment of the issue fee, and is accompanied by:

a. one of the certifications pursuant to 37 C.F.R. §1.97(e) set forth in paragraph 9 below; and

b. the attached petition requesting consideration of this Information Disclosure Statement; and

c. the fee due under 37 C.F.R. §1.17(i)(1) which is paid as set forth in paragraph 10 below.

8. ☐ A fee is due under 37 C.F.R. §1.17(i)(1) for this Information Disclosure Statement since it is being filed in compliance with:

a. ☐ 37 C.F.R. §1.313(b)(3), after the issue fee has been paid and information cited in this Information Disclosure Statement may render at least one claim unpatentable and is accompanied by the attached Petition To Withdraw

Application From Issue;

b. 37 C.F.R. §1.313(b)(5), after the issue fee has been paid and information cited in this Information Disclosure Statement is to be considered in a Continuation application upon abandonment of the instant application and is accompanied by the attached Petition To Withdraw Application From Issue.

c. The fee due under 37 C.F.R. §1.17(i)(1) is paid as set forth in paragraph 10 below.

9. ☐ I hereby certify that each item of information contained in this Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this Information Disclosure Statement.

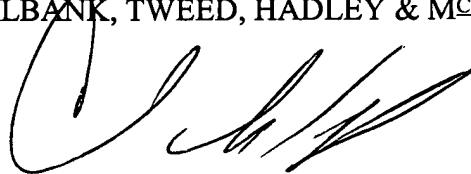
☐ I hereby certify that no item of information in the Information Disclosure Statement filed herewith was cited in a communication from a foreign patent office in a counterpart foreign application or, to my knowledge after making reasonable inquiry, was known to any individual designated in §1.56(c) more than three months prior to the filing of this Information Disclosure Statement.

10. ☐ A check in the amount of \$180.00 is enclosed in payment of the fee due under 37 C.F.R. §1.17(i)(1).

☒ Charge the fee due under 37 C.F.R. §1.17(i)(1) to Deposit Account No. 13-3250. Order No. 36287-00900. A DUPLICATE COPY OF THIS SHEET IS ATTACHED.

☒ The Assistant Commissioner is hereby authorized to charge any additional fees which may be required for this Information Disclosure Statement, or credit any overpayment to Deposit Account No. 13-3250. Order No. 36287-00900. A DUPLICATE COPY OF THIS SHEET IS ATTACHED.

Respectfully submitted,
MILBANK, TWEED, HADLEY & McCLOY LLP



November 30, 2005

Chris L. Holm, Esq.
Reg. No.: 39,227

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New York, NY 10005-1413

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(13)

Additional information relating to the Patent Application for:

Method and system for determining a company's probability of no default,

by Jean-Pierre Lardy, Vladimir Finkelstein, Philippe Khuong-Huu and Neil Yang

This document supplements the patent application with a review of the key differences between the formula in the application and similar (but different) approaches which were known in the literature at the time, as well as the recognition that the formula has gained in the field since its invention at JPMorgan in 2000.

I will refer to the formulas giving the probability of no default $B(T)$ (3 equations first appearing on page 2 of the patent application and in claim 23) as the E2C formula as it became known internally at JPMorgan, but it is also found in many documents under the commercial brand name CreditGrades of the Riskmetrics implementation of the invention and the website www.creditgrades.com.

1- References for the recognition of the formula since its first public presentation in April 2001

1-1 Presentations at conferences

The formula was first presented to the public in April 2001 by Lionel Pradier, managing director of JPMorgan, at a conference organized by Risk Magazine in Europe. These conferences are always widely attended by leading practitioners and academics. The methodology was subsequently presented by Jean-Pierre Lardy and Vladimir Finkelstein, together or separately, as well as Chris Finger from Riskmetrics in many other occasions listed below, such as conferences in Europe and the United States in 2001 and 2002, as well as roadshow sessions that were organized for the launch of CreditGrades by its endorsers (JPMorgan, Deutsche Bank, Goldman Sachs and Riskmetrics).

other
presentation

April
2001

- Risk 2001 Europe Conference, Paris, France
- ICBI Global Derivatives & Risk Management 2001, Juan-Les-Pins, France
- Risk Credit Summit 2001, London, UK
- Risk Credit Summit 2001, New York, USA
- ICBI Risk Management Conference 2001, Geneva, Switzerland
- JPMorgan Credit Derivatives Conference 2002, New York, USA
- ICBI Global Derivatives Conference, 2002, Barcelona, Spain
- Risk 2002 USA Conference, Boston, USA

CreditGrades Roadshows (May and June 2002):

Europe: UK(London), France (Paris), Italy(Milan), Germany(Frankfurt)
USA: New York, Chicago, San Francisco, Boston

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1-2 Publications and Applications:

By chronological order, below are 3 widely recognized publications and applications that took place between 2001 and 2003 and which directly acknowledge the formula and its origin.

1-2.1. George Pan published article in Risk Magazine (November 2001) which explicitly builds out a formula for credit default swaps spreads on the principles of the E2C formula. The latter is explicitly mentioned, as well as its authors, in a caption in the last page of the article. Risk Magazine (Monthly publication) is one of the most widely distributed reference in this field. This article is also published in the book: Credit Risk Modeling: the Cutting-edge collection, by Michael Gordy (Editor), Risk Books, April 30, 2003, Hardcover, 278 pages.

1-2.2. CreditGrades is a commercial methodology launched in May 2002 by The RiskMetrics Group and endorsed by JPMorgan, Deutsche Bank and Goldman Sachs to provide an industry standard of company specific risk measures that provide a robust and transparent source for default probabilities and credit spreads. The CreditGrades methodology has been integrated in other products and services offered by RiskMetrics such as RiskManager and CreditManager. It has its own website available at www.creditgrades.com. CreditGrades is directly derived from the E2C formula, as explain in detail in the widely distributed CreditGrades Technical Document, which is freely available for download on the website. In particular, the E2C formula is captioned, as well as its authors, at page 12.

1-2.3- A specific sub paragraph (9.5.2) of the chapter 9 on Firm Value Credit Risk models is dedicated to the E2C formula in a widely acclaimed book written in 2003 by Dr Philipp J. Schonbucher. Mr. Schonbucher is Professor at the University of Bonn, Germany and has degrees in mathematics from Oxford University and a PhD in Economics from Bonn University. He has taught various training courses and lectured at many conferences for practitioners on credit derivatives pricing, credit risk modeling, and implementation. The book title and references are:

Credit Derivatives Pricing Models: Model, Pricing and Implementation, by Philipp J. Schonbucher, John Wiley and Sons, January 15, 2003, Hardcover 600 pages

To conclude this section, one can also refer to the fact that CreditGrades has hundreds of references in internet based search engines (such as Google) so it would be impossible to give a full account of all the publications and references of this methodology since it became public in 2001.

2- Differences between the E2C formula and earlier approaches:

Since the first article published by Nobel Prize laureate Robert Merton in 1974 (in Appendix), the field of "Structural or Firm Value models of Credit Risk" has been a very

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prolific one and there have been many academic articles or publications which tackled the problem in one way or another. The paragraph 9.7 in the book by Dr. Schonbucher provides a quick summary of the field.

I give here a summary of the key differences which the E2C formula has with earlier approaches, mentioning in reference the 2 approaches of Merton (1974) and Black and Cox (1976) which have the highest degree of recognition as they were published 30 years ago (references below).

2.1- Earlier formulas (such as Merton) consider the probability of being in default "at maturity". Others (such as Black & Cox) consider a potential default "at any time" prior to maturity. E2C is also considering a potential default "at any time", but in addition, it allows for a non-zero probability of default even in the situation of an instantaneous maturity (time to maturity equal zero) (page 26 of the patent application).

2.2- Earlier formulas (such as Merton and Black & Cox) considered a company with only one class of debt, usually a zero coupon bond. E2C provides for a first order approximation valid, under reasonable assumptions, for any debt structure (page 10 of the patent application).

2.3- Earlier formulas (such as Merton and Black & Cox) use the important, but not directly observable, concepts of "asset value" and "asset volatility" but do not provide for a direct and convenient way to relate it with the observable "stock price" and "stock volatility". E2C provides a first order approximation (equation 10 and 11 page 13 of the patent application) allowing this direct calculation based on observable stock price and volatility information (page 12 to 14 of the patent application)

2.4- Earlier formulas (such as Black & Cox) do not use an uncertain "barrier trigger". The uncertainty of the default trigger in the form of a time independent random variable is an important new concept of E2C. In addition, E2C includes a specific approximation (equation 18 page 18 of the patent application), to keep its practical simplicity and avoid the additional mathematical difficulty of the exact formula with such "uncertain" trigger (page 17, 18 of the patent application).

2.5- Earlier formulas (such as Black and Cox) typically do not specify how the "barrier" trigger should be related to the overall indebtedness of the firm. E2C provides with a first order approximation which directly relates it to the important concept of "global debt recovery ratio", for which a specific historical survey was conducted in 2000 at JPMorgan by Hu and Lawrence, allowing calibration of both the expected level of the barrier trigger and its uncertainty from historical data (page 12, 13 and 17 of the patent application)

2.6- Earlier formulas (such as Merton and Black & Cox) use a risk free rate drift in the diffusion of the asset value to derive the mathematical expression of the probability of no default. E2C specifically excludes such a drift and forces it to zero in recognition than the

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underlying asset value process is in fact a “leverage” process of the assets relative to the debt level (page 16 of the patent application).

Jean-Pierre Lardy

London, November 11, 2005



References:

- 1- Black, F. and Cox, J., (1976), Valuing Corporate Securities: Some Effects of Bond Indentures provisions, *Journal of Finance*, 31: 351-367.
- 2- Merton, R. (1974), On the Pricing of Corporate Debt: The Risk Structure of Interest Rates, *Journal of Finance*, 29: 449-470.
- 3- Pan, George (2001). Equity to Credit Pricing, *Risk*, p.99-102, November
- 4- Finger C., Finkelstein V., Pan G., Lardy J-P., Ta T., and Tierney J., (2002) CreditGrades Technical Document, Riskmetrics Group. (www.creditgrades.com)
- 5- Credit Derivatives Pricing Models: Model, Pricing and Implementation, by Philipp J. Schonbucher, John Wiley and Sons, January 15, 2003, Hardcover 600 pages